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EXAMINER

ROJAS, OMAR R

ART UNIT PAPER NUMBER

2874

DATE MAILED: 08/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/073,450

Applicant(s)

MCGLASHAN-POWELL ET AL.

Examiner

Omar Rojas

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) 41 and 42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 and 37-40 is/are rejected.
- 7) ☒ Claim(s) 36 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.


## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: 

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-40, drawn to an optical router having a magneto optical rotator (MOR) therein, classified in class 385, subclass 6.
  - II. Claims 41-42 drawn to a method for directing optical signals using an optical router, classified in class 385, subclass 16.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case a different, non-magnetic optical router could be used in the invention of Group II.
3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with George Sai-Halasz on July 18, 2003, a provisional election was made without traverse to prosecute the invention of Group I, claims 21-40. Since claims 1-20 are drawn to an optical router comprising an MOR, the Examiner withdraws any previous oral restriction requirement and claims 1-20 have been examined with the instant Office action. Affirmation of this election must be made

by applicant in replying to this Office action. Claims 41-42 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Information Disclosure Statement***

6. The prior art documents submitted by applicant in the Information Disclosure Statement(s) filed on October 25, 2002 have all been considered and made of record (note the attached copy of form(s) PTO-1449).

***Specification***

7. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Objections***

8. Claims 25 and 38 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n).

9. Claim 3 is objected to because of the following informalities: The word "trough" appears to be misspelled in claim 3. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: That the current in the metallic strip is used to selectively switch the magnetic field.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. **Claims 1-3, 10-11, 16-17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,982,539 to Shirasaki.**

Regarding claims 1-2, Shirasaki discloses a router for polarized light (as seen in Fig. 2) comprising a magneto optic rotator ("MOR") (107); and a polarization beam splitter ("PBS") (106-2); wherein said MOR comprises a first section (107-1) wherein said first section a magnetic field may be selectively switched between two modes having equal magnitudes (45 degrees) but opposite directions (col. 8, ll. 6-16); a second section (107-2) where a permanent magnetization may prevail (col. 7, ll. 62-65).

Regarding claim 3, Shirasaki discloses essentially the same invention in view of the previous remarks and further in view of col. 5, ll. 1-12.

Regarding claims 10-11, Shirasaki also discloses an optical waveguide network (101-104) which the router and beam splitter (106-2) are part of.

Regarding claims 16-17, and 19, the Examiner incorporates the previous remarks. The invention of Shirasaki also defines a method essentially meeting all the recited steps of claims 16-17, and 19.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**15. Claims 4-6, 8, 9, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki as applied to claims 1-3 and 16-17 above, and further in view of U.S. Patent 4,859,013 to Schmitt et al. ("Schmitt").**

Regarding claims 4-6, 8, 9, and 18, the Examiner incorporates herein the previous remarks concerning Shirasaki.

Thus, Shirasaki expressly differs from claims 4-6, 8, 9, and 18, in that Shirasaki does not expressly disclose using magneto-optical waveguides for his sections (107) having the recited structure specified by claims 4-6, 8, 9, and 18.

Schmitt, on the hand, discloses a magneto-optical waveguide having a magneto-optically active layer (2) comprising yttrium iron garnet (YIG) and two additional optical layers (1, 3) having lower refractive indices than the magneto-optical layer (2), wherein one of said additional layers (1) comprises gadolinium gallium garnet (GGG). Id. at col. 3, ll. 34-50.

As Schmitt expressly states, his magneto-optical waveguide is useful for optical switches, such as the one disclosed by Shirasaki. Id. at col. 3, ll. 1-3.

Therefore, it would have been obvious to one of ordinary skill at the time of the claimed invention to obtain the invention specified by claims 4-6, 8, 9, and 18 by substituting the first and second sections (107) of Shirasaki with magneto-optical waveguides taught by Schmitt.

**16. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki in view of Schmitt as applied to claim 4 above.**

Regarding claim 7, the Examiner incorporates herein the previous remarks concerning Shirasaki in view of Schmitt.

Schmitt further shows in his Fig. 3A an inherently metallic strip/electromagnet (19) substantially covering the magneto-optical waveguide and used to generate a magnetic field by using electrical current.

Thus, all the limitations of claim 7 are rendered obvious by Shirasaki in view of Schmitt as well.

**17. Claims 12-15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki.**

Regarding claims 12-15, the Examiner incorporates herein the previous remarks concerning Shirasaki and claims 11 and 16.

Thus, Shirasaki expressly differs from claims 12-15 and 20, in that Shirasaki does not recite using the different types of PBS devices recited by claims 12-15 and 20.

However, the Applicant(s) have not disclosed a perceived criticality to the use of the recited PBS devices of claims 12-15 and 20. Furthermore, such PBS devices appear to have been well known in the art at the time of the claimed invention. Therefore, replacing the PBS of Shirasaki (106-2) with any of the claimed PBS devices would appear to have been an obvious design choice.

Therefore, it would have been obvious to one of ordinary skill at the time of the claimed invention to obtain the invention specified by claims 12-15 and 20 in view of Shirasaki and the fact that the specified PBS devices were well known in the art at the time of claimed invention.



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**18. Claims 21-25, 28-33, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,726,788 to Fee et al. ("Fee") in view of Shirasaki.**

Fee discloses an optical backplane (Fig. 3, 308) comprising a network of optical waveguides (Fig. 4B, 403-406); routers (Fig. 4C, 410); and optical devices (Fig. 4B, 408) for connecting processing units (312, 302) to said network (403-406). See col. 5, ll. 12-66.

Regarding claims 21, 25, 30, 32, and 37, Fee differs in that Fee does not expressly disclose that his routers (410) and optical devices (408) comprise magneto-optical rotators with PBS coupling optics for polarized light switching.

However, as previously discussed, Shirasaki discloses the use of magneto-optical switches having PBS coupling optics for polarized light. See the previous remarks under section 12.

As stated by Fee, "[the] basic unit of the optical switch may employ...any other technology known to people skilled in the art." Id. at col. 5, ll. 22-24.

Because the optical switches of Shirasaki are "easy to configure with a small number of components, and with reduced cross-talk," the ordinary skilled artisan would have desired to use them in the invention of Fee. See Shirasaki at col. 14, ll. 48-52.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to obtain the invention specified by claims 21, 25, 30, 32, and 37.

With regards to claims 22-24, the Examiner incorporates herein the previous remarks concerning Fee and Shirasaki which show the limitations of claim 21 to have been obvious.

Thus, Fee in view of Shirasaki differs from claims 22-24, in that the use of planar, strip, or cylindrical waveguides is not expressly discussed.

However, the Applicant(s) have not set forth a perceived criticality for the use of planar, strip, or cylindrical waveguides. Furthermore, such waveguide types were well known in the art at the time of the claimed invention. It is also inherent that Fee in view of Shirasaki must use at least one type of the recited optical waveguides. For at least these reasons, the use of planar, strip, or cylindrical waveguides would have been an obvious design choice in Fee in view of Shirasaki.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to modify Fee in view of Shirasaki to obtain the invention specified by claims 22-24.

With regards to claims 28-29, the Applicant(s) are further claiming the use of a well-known and conventional type of optical waveguide without a perceived criticality. Although not expressly disclosed by Fee in view of Shirasaki, the use of an optical waveguide having a doped silicon oxide layer, etc., as recited by claims 28-29 would have been an obvious design choice.

Therefore, it would have been obvious to one of ordinary skill at the time of the claimed invention to modify Fee in view of Shirasaki to obtain the invention specified by claims 28-29.

Regarding claim 31, the Examiner incorporates herein the previous remarks concerning Fee in view of Shirasaki and claim 25.

Thus, Fee in view of Shirasaki expressly differs from claim 31, in that Shirasaki does not recite using the different type of PBS device recited by claims 31.

However, the Applicant(s) have not disclosed a perceived criticality to the use of the recited PBS device of claim 31. Furthermore, such PBS device appears to have been well known in the art at the time of the claimed invention. Therefore, replacing the PBS of Shirasaki (106-2) with the claimed PBS device would appear to have been an obvious design choice.

Therefore, it would have been obvious to one of ordinary skill at the time of the claimed invention to obtain the invention specified by claim 31 in view of Fee in view of Shirasaki and the fact that the specified PBS device was well known in the art at the time of claimed invention.

Regarding claim 33, the Examiner incorporates herein the previous remarks concerning Fee in view of Shirasaki and claim 25.

Shirasaki further teaches using grating coupling optics (903) for light receiving device (904). Id. at col. 14, ll. 25-39.

Thus, all the limitations of claim 33 are rendered obvious by Fee in view of Shirasaki.

**19. Claims 26, 27, 34, 35, 36, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fee in view of Shirasaki as applied to claims 25 and 37 above, and further in view of Schmitt.**

Fee in view of Shirasaki expressly differs from claims 26, 27, 34, and 38-39, in that Shirasaki does not expressly disclose using magneto-optical waveguides for his first and second sections (107) having the recited structure specified by claims 26, 27, 34, and 38-39.

Schmitt, on the hand, does disclose a magneto-optical waveguide having a magneto-optically active layer (2) comprising yttrium iron garnet (YIG) and two additional optical layers (1, 3) having lower refractive indices than the magneto-optical layer (2), wherein one of said additional layers (1) comprises gadolinium gallium garnet (GGG). Id. at col. 3, ll. 34-50.

As Schmitt expressly states, his magneto-optical waveguide is useful for optical switches, such as the one disclosed by Shirasaki. Id. at col. 3, ll. 1-3.

Therefore, it would have been obvious to one of ordinary skill at the time of the claimed invention to modify Fee in view of Shirasaki to obtain the invention specified by claims 26, 27, 34, and 38-39, by substituting the first and second sections (107) of Shirasaki with the magneto-optical waveguides taught by Schmitt.

Regarding claim 35, the Examiner incorporates herein the previous remarks concerning claim 26 and further notes that the MORs taught by Schmitt could be used in the optical switching units (402, 408) of Fee and thus would be external to the actual waveguide network (403, 404).

Shirasaki further teaches using grating coupling optics (903) for a light receiving device (904). Id. at col. 14, ll. 25-39.

Thus, all the limitations of claim 35 are rendered obvious by Fee in view of Shirasaki and further in view of Schmitt.

Regarding claim 40, the Examiner incorporates herein the previous remarks concerning claim 38.

Thus, Fee in view of Shirasaki and further in view of Schmitt differs from claim 40, in that Shirasaki does not disclose using the specific PBS device recited by claim 40.

However, the Applicant(s) have not disclosed a perceived criticality to the use of the recited PBS device of claim 40. Furthermore, such a PBS device appears to have been well known in the art at the time of the claimed invention. Therefore, replacing the PBS of Shirasaki (106-2) with the claimed PBS device would appear to have been an obvious design choice.

Therefore, it would have been obvious to one of ordinary skill at the time of the claimed invention to further modify Fee in view of Shirasaki in view of Schmitt to obtain the invention specified by claim 40 by using an alternative PBS device in Shirasaki.

***Allowable Subject Matter***

20. Claim 36 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. The following is a statement of reasons for the indication of allowable subject matter: The arrangement for an optical backplane recited by claim 36 and exemplified in Fig. 5B of the drawings appears to disclose a novel and useful arrangement for

wavelength division multiplexing within an optical backplane through the use of the optical routers comprising MORs.

**Conclusion**

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 3,990,776 discloses a magneto-optical waveguide device for optical switching.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar Rojas whose telephone number is (703) 305-8528 and whose e-mail address is *omar.rojas@uspto.gov*. The examiner can normally be reached on Monday-Friday (7:00AM-3:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hemang Sanghavi, can be reached on (703) 305-3484. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722 for regular communications. The examiner's personal work fax number is (703) 746-4751.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Omar Rojas  
Patent Examiner  
Art Unit 2874

or  
July 23, 2003

  
Brian Healy  
Primary Examiner